

Office of Information Services  
Procedure

***How to Assess Project Risk***

Version 1.2

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## 1. Purpose

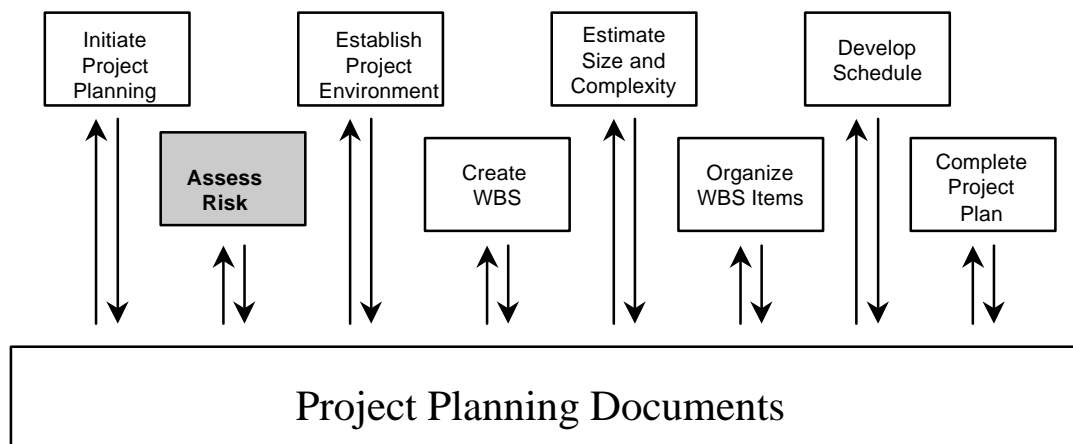
The purpose of the AMI procedure, *How to Assess Project Risk*, is to identify and analyze risks associated with a project and develop risk mitigation strategies as part of planning the project. This document describes the steps for examining a project and identifying areas of potential risk. Steps for risk monitoring are NOT included in this procedure, but the framework for monitoring may be determined by this activity. This procedure describes the *Assess Risk* activity found in the *AMI Project Planning Process*.

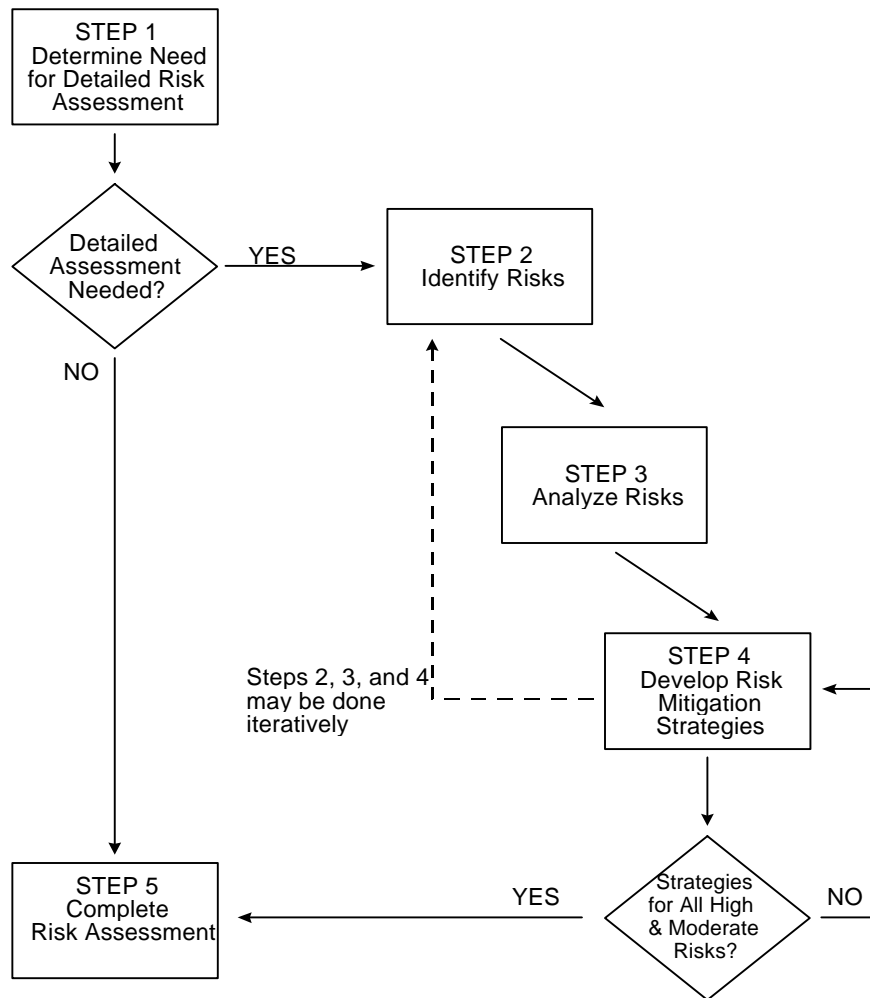
## 2. Overview

The *Assess Risk* activity provides a common framework and terminology for identifying and analyzing the risks in carrying out an individual project. If a detailed risk assessment is needed, the *Risk Analysis Worksheet* identifies risks by type and level, as well as the risk mitigation strategies appropriate for the project.

### 2.1 PROJECT PLANNING ROAD MAP

Project planning will always begin with the *Initiate Project* activity and end with the *Complete Project Plan* activity. The remaining project planning activities may be ordered to fit the specific needs of the project. This road map shows that as project planning activities are conducted and information is gathered activities may need to be revisited, and in some cases, conducted simultaneously. The project planning activity referenced in this procedure is highlighted in the diagram below.



**2.2 FLOW OF AMI RISK ASSESSMENT PROCEDURE**

**2.3 ROLES INVOLVED IN THE RISK ASSESSMENT PROCEDURE**

<b>Role</b>	<b>Function</b>
Project Leader	Manage the project. Responsible for identifying and analyzing risks, developing risk mitigation strategies, and assuring that project documentation is complete.
Project Team Members	Carry out the project. Responsible for identifying and analyzing risks and developing risk mitigation strategies.
Management	Oversee the project and serve as a source of information for identifying and analyzing risks, and developing risk mitigation strategies.
Customer	Sponsor and/or fund the project. Should be knowledgeable about the product's business environment, its potential external influences, and the consequences if it fails to function in accordance with specifications. Serve as a source of information for identifying risks and developing risk mitigation strategies.
End Users	Work directly with the end product. Should be knowledgeable about the end project, the environment in which it must function, and the consequences if it fails to function in accordance with specifications. Serve as a source of information for identifying risks, and developing risk mitigation strategies.

## 2.4 RESPONSIBILITIES OF THE ROLES

The project leader has the primary responsibility for carrying out and documenting all the steps of the AMI procedure *How to Assess Project Risk*. Throughout the project's risk assessment, the project leader is encouraged to collect information and ideas from team members, management, customers, end users, and peers who have done similar projects.

In the diagram that follows, the roles are mapped to the procedure steps in which they are involved. The dark shading indicates that the corresponding role has primary responsibility for the activity; the light shading indicates that the corresponding role may be involved but not responsible for the activity. No shading indicates that the corresponding role is not involved in the activity.

ROLE	Step 1 Determine need for detailed risk assessment	Step 2 Identify risks	Step 3 Analyze risks	Step 4 Develop risk mitigation strategies	Step 5 Complete Risk Assessment	Step 6 Capture & Document Measurements
Project Leader						
Project Team Members						
Management						
Customer						
End Users						

## 2.5 DOCUMENTS USED IN THE RISK ASSESSMENT PROCEDURE

Note: Appendices' A and B contain samples and/or copies of the documents listed below. The latest version of each document is maintained in the SEPG Process Asset Library (SEPG PAL). When a worksheet or template document is needed for the project, a copy of the latest version may be obtained from the SEPG PAL.

All documents should be completed by the project leader and become part of the project's planning documentation.

Documents	Explanation
<i>Determining the Need for a Detailed Risk Assessment Worksheet</i>	A brief worksheet of project characteristics in terms of complexity, size, and criticality used to determine and document the need for a detailed risk assessment.
<i>Risk Analysis Worksheet</i>	Worksheet for documenting the identified risks, their impact, their likelihood, and overall risk level. Also used to link each risk to the strategies that mitigate it.

<b>Documents</b>	<b>Explanation</b>
<i>Risk Types and Questions for Identifying Risks</i>	List of categories and questions for identifying risks. Used in conjunction with the <i>Risk Analysis Worksheet</i> .
<i>Relationship of Impact and Likelihood to Risk Level</i>	Definitions and tables for determining overall risk level (high, moderate, low, or not significant) based on the potential impact of the risk and its likelihood. Used in conjunction with the <i>Risk Analysis Worksheet</i> .
<i>Risk Assessment Metrics</i>	Concluding sections of the <i>Determining the Need for a Detailed Risk Assessment Worksheet</i> and the <i>Risk Analysis Worksheet</i> .

### **3. Entry Criteria**

Before starting risk assessment for a project the following conditions should be true.

- A Customer-Provider Agreement (CPA) has been signed that outlines project scope, high level risks, and high-level business needs.
- A project leader has been assigned to the project.

## 4. Procedure Steps

Step Description	Performed By
<p><b>4.1 DETERMINE THE NEED FOR A DETAILED RISK ASSESSMENT</b></p> <p>4.1.1 <b>Complete the</b> Determining <i>the Need for Detailed Risk Assessment Worksheet</i>.</p> <p><u>Note:</u> If it is determined that there is NOT a need for a more detailed risk assessment, go to Step 5 -- Complete Risk Assessment.</p> <p>See <i>Determining the Need for Detailed Risk Assessment Worksheet</i> in Appendix A for further information.</p>	Project Leader
<p><b>4.2 IDENTIFY RISKS</b></p> <p>4.2.1 <b>Complete the</b> <i>Risk Type</i> and <i>Risk Description</i> columns in the <i>Risk Analysis Worksheet</i>.</p> <p>See <i>Risk Categories and Questions for Identifying Risks</i> in Appendix B (6.2.1) for further information.</p>	Project Leader
<p><b>4.3 ANALYZE RISKS</b></p> <p>4.3.1 <b>Categorize the potential impact of the risk on the project</b></p> <ul style="list-style-type: none"> <li>• Catastrophic (project failure)</li> <li>• Critical (project harmed)</li> <li>• Marginal (annoyance)</li> <li>• Minimal (minor or no effect)</li> </ul> <p>4.3.2 <b>Categorize likelihood of risk</b></p> <ul style="list-style-type: none"> <li>• Very probable (3 chances in 4)</li> <li>• Probable (even odds)</li> <li>• Improbable (1 chance in 4)</li> <li>• Impossible (cannot happen)</li> </ul> <p>4.3.3 <b>Assign a level to each risk, based on the potential impact and likelihood.</b></p> <p>See 6.2.2.3 in Appendix B for further information.</p> <p>The levels of risk are:</p> <ul style="list-style-type: none"> <li>• High = 1</li> <li>• Moderate = 2</li> <li>• Low = 3</li> <li>• Not Significant = 4</li> </ul> <p>4.3.1 <b>Sort the</b> <i>Risk Analysis Worksheet</i> <b>by risk level.</b></p> <p>See <i>Relationship Of Impact And Likelihood To Risk Level</i> in Appendix B (6.2.2) for more information.</p>	Project Leader



Step Description	Performed By
<p><b>4.4 DEVELOP RISK MITIGATION STRATEGIES</b></p> <p><b>4.4.1 Determine which risks require mitigation strategies.</b></p> <ul style="list-style-type: none"> <li>• High level risks require a detailed, written risk mitigation strategy.</li> <li>• Moderate level risks may need mitigation or control strategies.</li> <li>• Low risks can be handled as a group requiring less detailed mitigation and control strategies.</li> </ul> <p><b>4.4.2 Develop risk mitigation strategies to meet project requirements.</b></p> <ul style="list-style-type: none"> <li>• Identify standard processes and procedures to serve as mitigation and control strategies.</li> <li>• Identify risk-monitoring methods as part of the overall risk mitigation strategy.</li> <li>• Identify product quality metrics and monitoring as part of the overall risk mitigation strategy.</li> </ul> <p><b>4.4.3 Document the risk mitigation strategies for each risk by completing the <i>Strategy</i> column in the <i>Risk Analysis Worksheet</i>.</b></p> <p>See <i>Suggestions for Risk Mitigation Strategy Development</i> in Appendix B (6.2.3) for further details.</p>	<p><b>Project Leader</b></p>
<p><b>4.5 COMPLETE RISK ASSESSMENT</b></p> <p><b>4.5.1 Complete the <i>Measures</i> section of the <i>Determining the Need for Detailed Risk Assessment Worksheet</i> and/or the <i>Risk Analysis Worksheet</i>.</b></p> <ul style="list-style-type: none"> <li>• Tally the number of risks identified by type and level.</li> <li>• Record the time and resources expended doing the risk assessment.</li> </ul> <p><b>4.5.2 Review the risk assessment documents and check that they are complete, accurate, and up-to-date.</b></p> <p><b>4.5.3 Update the risk management and risk mitigation sections of the PMP with the results</b></p>	<p><b>Project Leader</b></p>
<p><b>4.6 CAPTURE AND DOCUMENT MEASUREMENTS FOR THIS PROCEDURE</b></p> <p><b>4.6.1 Record time required by skill level.</b></p> <p><b>4.6.2 Record non-personnel related expenses incurred from this procedure.</b></p> <p><b>4.6.3 Record special resources required (i.e. consultants, books, and training.)</b></p>	<p><b>Project Leader</b></p>

## 5. Exit Checklist

	<i>Determining the Need for Detailed Risk Assessment Worksheet</i> has been completed for ALL projects.
	<i>Risk Analysis Worksheet</i> has been completed for each risk assessment.
	Measurements about time and resources required to do the risk assessment have been collected and recorded.

## 6. Appendices

### 6.1 APPENDIX A: RISK ASSESSMENT WORKSHEET AND SAMPLES

#### 6.1.1 Determining the Need for a Detailed Risk Assessment Worksheet

The *Determining the Need for a Detailed Risk Assessment Worksheet* should be completed for EVERY project. It is brief and involves a high-level review of project characteristics in the categories of complexity, size, and criticality.

For projects that fall below the threshold, this worksheet serves as the primary risk assessment document. When it is determined that a more detailed risk assessment is not needed, then the completed *Determining the Need for a Detailed Risk Assessment Worksheet* should be included with the Project Management Plan and other project planning documentation.

For projects that do require a more detailed risk assessment, the *Determining the Need for a Detailed Risk Assessment Worksheet* becomes part of the *Risk Assessment Report*. The project characteristics that are marked “true” on the worksheet are starting points for identifying risks critical to the project’s success.

## Determining the Need for a Detailed Risk Assessment Worksheet

<b>Project Name:</b>
<b>Project Leader:</b>
<b>Date:</b>

Answer the following questions about the project. For further information see AMI's procedure *How to Assess Project Risk* which is available in the SEPG PAL.

### Project Complexity

	True	False
The project uses a new technology (in beta, for example).	<input type="checkbox"/>	<input type="checkbox"/>
The project uses a technology new to the organization doing the work.	<input type="checkbox"/>	<input type="checkbox"/>
The project involves multiple organizations (including within AMI, within FAA, outside of agency, or a vendor organization).	<input type="checkbox"/>	<input type="checkbox"/>
The project is other than a local system (i.e. - remote sites and/or users).	<input type="checkbox"/>	<input type="checkbox"/>
The project team does not have an established, positive working relationship with the sponsoring program office.	<input type="checkbox"/>	<input type="checkbox"/>
Other factors that make project complex (please specify)	<input type="checkbox"/>	<input type="checkbox"/>

### Project Size

	True	False
The project is estimated to have a calendar duration of more than 6 months.	<input type="checkbox"/>	<input type="checkbox"/>
The project is estimated to cost more than \$100,000 (including labor).	<input type="checkbox"/>	<input type="checkbox"/>
Other estimates that make project large in scale (please specify)	<input type="checkbox"/>	<input type="checkbox"/>

### Project Criticality

	True	False
The project is critical to the mission of the customer.	<input type="checkbox"/>	<input type="checkbox"/>
The project is critical to the continued success of AMI.	<input type="checkbox"/>	<input type="checkbox"/>
The project is politically significant to the FAA or AMI.	<input type="checkbox"/>	<input type="checkbox"/>
The project entails specific performance, cost, or schedule requirements with little margin for error.	<input type="checkbox"/>	<input type="checkbox"/>
Other factors that make project critical (please specify)	<input type="checkbox"/>	<input type="checkbox"/>

If any of the previous statements is true for this project then a detailed risk assessment is required. A detailed risk assessment may be desirable even if all of the above statements are false.

- ☐ **A detailed risk assessment is needed for this project.**  
☐ **A detailed risk assessment is NOT needed for this project.**

Comments (optional):

#### **Measures for Determining the Need for a Detailed Risk Assessment**

☐ **Metrics about time and resources required to complete the risk assessment worksheet have been collected and recorded.**

- ☐ Person hours/days  
☐ Skill levels  
☐ Non-personnel-related costs

When the project leader completes this document it should be filed with the other planning documents for the project. If a more detailed risk assessment is not needed then this document should be appended to the Project Management Plan. If a detailed Risk Assessment is needed then this worksheet should become part of the *Risk Assessment Report*.

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### 6.1.2 Risk Analysis Worksheet

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A blank template of the *Risk Analysis Worksheet* can be found in the SEPG PAL. This worksheet is the core of the documentation for a detailed risk assessment. It can be constructed in several ways, for example, as an MS Word table or as an Excel spreadsheet. What is important is the content. The columns should include:

- Type of Risk
- Brief Description of Risk or Concern
- Impact of Risk
- Likelihood of Risk
- Level of Risk
- Strategy to Mitigate Risk
- Check-off that Strategy is Documented

In completing this worksheet, the project leader should strive to identify and analyze those risks that could have the greatest impact and that are most likely to occur. Risks that are deemed either to be of no significant impact or impossible, should be documented as considered.

The following is a sample of a completed *Risk Analysis Worksheet*.

**Example of a completed *Risk Analysis Worksheet***

Type of Risk	Brief Description of Risk or Concern	Impact of Risk	Likelihood of Risk	Level of Risk	Strategy to Mitigate Risk
Resource	could lose the one person who knows technology, old system, and design for new	Catastrophic	Improbable	High	assure they will be available when needed; train alternate/back-up
Resource	only 70% of required workstations are available at project start	Critical	Probable	Moderate	strong acquisitions plan and monitoring of same
Resource	large team, anticipate 10-25% turnover over project life cycle	Critical	Probable	Moderate	on-going documentation and training plan
Resource	only partial funding available at start of project	Marginal	Very Probable	Moderate	plan project so there is concrete deliverable to support future funding requests
Schedule	deadline imposed by law, but project started too late to meet full requirements	Critical	Very Probable	High	chose phased life cycle; monitor progress closely
Schedule	customer and management would not approve managment reserve	Marginal	Probable	Low	high end estimates used for scheduling
Cost	if funds not available to buy workstations, project schedule will be extended increasing total cost	Critical	Improbable	Low	push for prompt funding and acquisition
Cost	turnover in personnel could increase training costs and delay schedule	Marginal	Improbable	Low	on-going documentation and training plan
Product Performance	technology will be new to end users, anticipate resistance to change	Marginal	Very Probable	Moderate	plan for ease-of-use, end-user training, and support
Product Performance	using technology new to project team, may not produce expected results in most efficient and effective manner	Marginal	Improbable	Low	good training, sharing of expertise, bring an expert on to the team
Product Performance	end product must work in customer's	Marginal	Improbable	Low	as part of test plan set-up testbed

Type of Risk	Brief Description of Risk or Concern	Impact of Risk	Likelihood of Risk	Level of Risk	Strategy to Mitigate Risk
	platform, which is highly customized				just like customer's platform
Mgt / Process	expect change in support services contract during project life cycle	Critical	Probable	Moderate	allow for in management reserves, have good documentation and training plans in place should turn over occur
Mgt / Process	Program office is in Washington, development will be done in OKC, miscommunication is likely	Marginal	Probable	Low	plan for regular communication via reports, telecons, and e-mail
Mgt / Process	new customer, not familiar with AMI processes	Marginal	Probable	Low	plan for intro briefings, make expectations clear
Mgt / Process	project is critical to AMI reputation; if this project is not seen as successful we'll lose opportunity to do several similar projects	Critical	Improbable	Low	follow all recommended procedures, as well as the mandatory ones; look for best practices and lessons learned from similar projects
External	COTS package to do very similar function may be available before in-house development is complete	Critical	Improbable	Low	monitor COTS market, make recommendations in best interest of FAA
External	project implements new regulations that may be changed or rescinded	Critical	Improbable	Low	monitor activity of regulatory group, involve customer in this activity



**Summary of Risks Identified**

Type of Risk	Number of High Level	Number of Moderate Level	Number of Low Level	Number of Not Significant	Total Identified
Resource Risks	1	3			4
Schedule Risks	1		1		2
Cost Risks			2		2
Product Performance Risks		1	2		3
Management and Process Risks		1	3		4
External Risks			2		2
<b>TOTALS</b>	<b>2</b>	<b>5</b>	<b>10</b>		<b>17</b>

☒ Metrics about time and resources required to complete the *Risk Analysis Worksheet* have been collected and recorded.

☒ Person hours/days 1.5 hr

☒ Skill levels FS-13

☒ Non-personnel-related costs \$0

*Upon completion by the project leader, this document should be filed with the other planning documents for the project.*

## 6.2 APPENDIX B: SOURCE DOCUMENTS FOR RISK ASSESSMENT

### 6.2.1 Risk Types and Questions for Identifying Risks

Use the table below as a guideline when completing columns 1 and 2 of the *Risk Analysis Worksheet*. Consider all risk types listed below. The questions in the *Description* column are intended to stimulate thought; not limit thought.

There may be additional areas of risk unique to a project, a technology, workgroup, or customer. These should be captured in the *Risk Analysis Worksheet* as well. *Risk Analysis Worksheets* from similar projects are also a good source of information.

Risk Type	Description
Resource Risks	<p>Risks related to personnel, infrastructure, and funding availability.</p> <ul style="list-style-type: none"> <li>• Are the necessary resources available to do the work? <ul style="list-style-type: none"> <li>✓ Equipment and development tools</li> <li>✓ Space/location</li> <li>✓ Telecommunications</li> </ul> </li> <li>• Are the necessary people available to do the work? <ul style="list-style-type: none"> <li>✓ Do they have skills and knowledge needed?</li> <li>✓ How probable is team turnover?</li> <li>✓ Training and potential turnover are particularly of concern when dealing with new technologies or projects of long duration.</li> </ul> </li> <li>• Can funding resources be depended upon throughout the project life cycle? <ul style="list-style-type: none"> <li>✓ Especially crucial when project is of long duration and/or funding source is not local.</li> </ul> </li> </ul>
Schedule Risks	<p>Risks related to timely completion of the work.</p> <ul style="list-style-type: none"> <li>• Is there adequate time to meet deadlines?</li> <li>• Is the schedule flexible?</li> <li>• Is the schedule realistic?</li> <li>• Is there specific time allocated to uncertainty (management reserve)?</li> </ul>
Cost Risks	<p>Risks related to project budget and costs.</p> <ul style="list-style-type: none"> <li>• Are there inaccurate estimates of costs?</li> <li>• What is the impact of unavailable funds?</li> <li>• If there were an extension of schedule, how would costs be affected?</li> <li>• How would a change in requirements (especially an increase) affect costs?</li> <li>• Are there sufficient funds to account for the unexpected (management reserve)?</li> </ul>

Risk Type	Description
Product Performance Risks	<p>Risks that the end product may not satisfy the customer.</p> <ul style="list-style-type: none"> <li>• Are the technical or functional requirements complete and accurate?</li> <li>• Is the appropriate technology available? Fully mature?</li> <li>• How will the project be fielded and maintained?</li> <li>• Are requirements flexible (vs. rigid) or poorly understood?</li> <li>• Will training be necessary for the customer and/or end users?</li> </ul>
Management and Process Risks	<p>Risks related to how the work is done.</p> <ul style="list-style-type: none"> <li>• Has functional support been addressed?</li> <li>• Have communication and control strategies been identified to deal with stakeholders and all other appropriate parties? <ul style="list-style-type: none"> <li>✓ Particularly important when dealing with multiple organizations that are not co-located</li> </ul> </li> <li>• Is it possible that any opportunities have been overlooked that could enhance the project?</li> <li>• Does the project make good business sense for the organization?</li> <li>• Have all necessary approvals been identified and obtained?</li> <li>• Is there a plan in place that addresses accountability?</li> <li>• What procedures are in place to prevent failure in controlling requirements?</li> <li>• What is in place to guarantee that information is timely, accurate, and sufficiently detailed?</li> <li>• Have alternatives been addressed? <ul style="list-style-type: none"> <li>✓ Technology?</li> <li>✓ Vendor?</li> <li>✓ Approach?</li> </ul> </li> <li>• Has each of the following areas of the development cycle been well thought out and planned? <ul style="list-style-type: none"> <li>✓ Analysis?</li> <li>✓ design</li> <li>✓ Implementation?</li> <li>✓ Testing?</li> <li>✓ Documentation?</li> </ul> </li> </ul>
External Risks	<p>Risks not related to the customer and development groups.</p> <ul style="list-style-type: none"> <li>• What if the technology the project depends on changes? <ul style="list-style-type: none"> <li>✓ Particularly important if dealing with “beta” versions of tools.</li> </ul> </li> <li>• Are there dependencies on other groups that could adversely affect the project?</li> <li>• Is there an assurance that project funding will not be cut? <ul style="list-style-type: none"> <li>✓ Is there an alternative plan in place if funding is cut?</li> </ul> </li> <li>• Are there measures in place to handle natural disasters?</li> <li>• What happens if politics (outside AMI) interfere with the success of the project?</li> <li>• How would external constraints be dealt with should they occur?</li> <li>• What if laws and/or regulations pertaining to the project are changed?</li> </ul>

## 6.2.2 Relationship of Impact and Likelihood to Risk Level

### 6.2.2.1 Impact of Risk

The impact of a risk is determined by a hypothetical analysis of what the result would be if the risk occurred. Results should be considered in terms of both the end product and the project. The impact of each risk should be entered in column 3 of the *Risk Analysis Worksheet*.

<b>Impact Category</b>	<b><i>If this risk occurred the result would be:</i></b>
<b>Catastrophic</b>	Product or project failure. <ul style="list-style-type: none"> <li>• End product would not be useful at all</li> <li>• Project would not be completed</li> </ul>
<b>Critical</b>	Product or project harmed. <ul style="list-style-type: none"> <li>• End product would have limited usefulness</li> <li>• Project would be completed too late to meet user's primary needs</li> </ul>
<b>Marginal</b>	Annoyance. <ul style="list-style-type: none"> <li>• End product would have most, but not all, functionality</li> <li>• Workarounds would be required to provide some promised functionality</li> <li>• Project would be delayed, but not seriously</li> </ul>
<b>Minimal</b>	Minor or no effect. <ul style="list-style-type: none"> <li>• Effect on product functionality would not be noticeable by end users</li> <li>• Effect on the project could be absorbed by management reserve in schedule and/or budget.</li> </ul>

### 6.2.2.2 Likelihood of Risk

The likelihood of a risk is determined by considering how probable it is that the risk will occur. The likelihood of each risk should be entered in the *Risk Analysis Worksheet*.

<b>Likelihood Category</b>	<b><i>The likelihood of this risk happening is:</i></b>
<b>Very Probable</b>	3 chances in 4, or more
<b>Probable</b>	Even odds, 50:50 chance
<b>Improbable</b>	1 chance in 4, or less
<b>Impossible</b>	Can not happen

### 6.2.2.3 Level of Risk

The following table shows how the impact of a risk and the likelihood of the same risk are used to determine the overall level of that risk. The *Risk Analysis Worksheet* has columns for entering the risk's impact, likelihood, and level.

Impact\Likelihood	Very probable	Probable	Improbable	Impossible
<b>Catastrophic</b>	High	High	Moderate	Not Significant
<b>Critical</b>	High	Moderate	Low	Not Significant
<b>Marginal</b>	Moderate	Low	Low	Not Significant
<b>Minimal</b>	Not Significant	Not Significant	Not Significant	Not Significant

The same information for determining risk level based on impact and likelihood is presented below in a different manner.

<i>If the Impact is:</i>	<i>And the Likelihood is:</i>	<i>Then the Risk Level is:</i>
Catastrophic	Very Probable	High Risk
	Probable	High Risk
	Improbable	Moderate Risk
	Impossible	No Significant Risk
Critical	Very Probable	High Risk
	Probable	Moderate Risk
	Improbable	Low Risk
	Impossible	No Significant Risk
Marginal	Very Probable	Moderate Risk
	Probable	Low Risk
	Improbable	Low Risk
	Impossible	No Significant Risk
Minimal	Very Probable	No Significant Risk
	Probable	No Significant Risk
	Improbable	No Significant Risk
	Impossible	No Significant Risk

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### 6.2.3 Suggestions for Developing Risk Mitigation Strategies

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To accomplish anything involves risk. The purpose of risk assessment (and indeed of project planning as a whole) is to find the optimal balance between minimizing the risks and producing the desired end product efficiently and effectively. Risks can be dealt with in four ways:

1. avoided = action taken so risk will not occur
2. mitigated = decrease the impact and/or likelihood of risk occurring
3. controlled = allowed to occur, but monitored and reacted to at some threshold

#### 4. ignored = no action

The appropriate approach depends on the impact and likelihood of the risk and the cost of avoiding the risk.

In many ways the entire project planning process is a risk mitigation strategy. The contents of the *Risk Analysis Worksheet* should help focus the attention and energies of the project leader on those areas of planning that will most benefit the project. It is important that all high level risks be recognized. If it is not reasonable or feasible to avoid the high level risks, then they should be mitigated or controlled. Risks that are deemed to be of no significance can be ignored.

Risks are often interlinked. Sometimes decreasing one risk will increase another. For example, adding more personnel to a project to assure that it is completed on time will increase the cost and add to project complexity. One does not want to spend so much time and energy avoiding or monitoring risks that little or no progress is made on the project.

Often one aspect of a project can result in related risks in several different type categories. A strategy that decreases the risk in one area can also have positive impacts in other areas. For example, if a team is working with a new technology there are:

- resource risks (trained personnel may not be available when needed);
- schedule risks (ability to estimate time to develop is less certain with new tools);
- cost risks (uncertain schedule, possible need for expert personnel or additional training);
- product performance risks (may not be able to develop all functionality, possible resistance by end users to change);
- management and process risks (may not use tools in the most effective or efficient manner);
- external risks (new technology is more likely to change or have a better alternative appearance).

In this situation, assuring that the development team includes an expert on the new technology and/or that all team members have adequate, timely training on the technology will positively affect the other risks (except external). Clearly mitigation strategies that have such a “ripple effect” should be looked for and pursued.

Monitoring project progress in terms of schedule, cost, and quality is a key way to control risks overall. It is easier to deal with a potential problem when recognized early. A sound project plan, an effective tracking against that plan, appropriate management reserves (in the schedule and the budget), and adjustment of the plan when necessary are ways to control a wide range of moderate and low risks.

## 7. Glossary

### 7.1 ACRONYMS

<i>AMI</i>	Office of Information Services
<i>CPA</i>	Customer-Provider Agreement
<i>FAA</i>	Federal Aviation Administration
<i>PAL</i>	Process Asset Library
<i>PMP</i>	Project Management Plan
<i>SEPG</i>	Software Engineering Process Group

### 7.2 TERMS

<i>Catastrophic</i>	The category of risk impact when the result of the risk occurring would be failure of the project and/or product.
<i>Cost risks</i>	The category of risks related to project budget and costs.
<i>Critical</i>	The category of risk impact when the result of the risk occurring would be serious harms or damage to the project and /or product.
<i>External risks</i>	The category of risks resulting from factors outside the organization, such as changes in laws or regulations or changes in technology, etc.
<i>Functional performance risks</i>	The category of risks that the end product may not satisfy the customer.
<i>High risk</i>	The level of risk where the risk has one of the following combinations of impact and likelihood: catastrophic and very probable, or catastrophic and probable, or critical and very probable.
<i>Impossible</i>	The category of risk likelihood when the risk can not occur during the project.
<i>Improbable</i>	The category of risk likelihood when chances are one in four (or less) that the risk will occur during the project.

<i>Low risk</i>	The level of risk where the risk has one of the following combinations of impact and likelihood: critical and improbable, or marginal and probable, or marginal and improbable.
<i>Management and process risks</i>	The category of risks associated with how the work is done.
<i>Marginal</i>	The category of risk impact when the result of the risk occurring would be annoyance.
<i>Moderate risk</i>	The level of risk where the risk has one of the following combinations of impact and likelihood: catastrophic and improbable, or critical and probable, or marginal and very probable.
<i>No significant risk</i>	The level of risk where the risk has either no impact or its likelihood is impossible.
<i>Minimal</i>	The category of risk impact when the result of the risk occurring would be no noticeable effect on the project and /or product.
<i>Probable</i>	The category of risk likelihood when chances are even (50:50) that the risk will occur during the project.
<i>Resource risks</i>	The category of risks related to personnel, infrastructure, and funding availability.
<i>Risk assessment</i>	Identification and analysis of risks and development of strategies for mitigating those risks. Risk assessment is an activity of the project planning process. [See also: <b>risk management</b> . Compare with: <b>risk monitoring</b> ]
<i>Risk management</i>	Encompasses risk assessment, risk mitigation strategies, and risk monitoring [See also: <b>risk assessment, risk mitigation strategies, risk monitoring.</b> ]
<i>Risk mitigation strategies</i>	Ways in which project risks can be avoided, prevented, controlled, assumed, or transferred. These strategies include identification of key factors that drive risk and ways to monitor those factors. [See also: <b>risk assessment, risk monitoring.</b> ]
<i>Risk monitoring</i>	Tracking of key factors to determine whether the risk to a project has changed. As a result of risk monitoring the project planning process, and specifically the risk assessment activity, may be re-visited. [See also: <b>risk management, risk monitoring.</b> Compare with: <b>risk assessment</b> ]
<i>Schedule risks</i>	The category of risks related to timely completion of the work.
<i>Very probable</i>	The category of risk likelihood when chances are 3 out of 4 (or more) that the risk will occur during the project.



## 8. Reference Documents

Document Name	Storage Location
<i>The Capability Maturity Model: Guidelines for Improving the Software Process</i>	SEPG Library MPB 248A

## 9. Document Control

### 9.1 APPROVAL

The following groups and individuals have approved this document:

- AMI Software Engineering Process Group

Signatures are on file in the SEPG Library.

### 9.2 DOCUMENT HISTORY

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0.1	5/29/97	Original Issue
0.1	8/5/97	Revisions by Lori
0.9	8/19/97	Ready for pilot
1.0	4/15/98	Approved by SEPG and Steering Group
1.1	7/10/98	Revisions to synchronize with Project Classification Standard
1.2	8/30/98	Revisions by Maria (per feedback document)

### 9.3 DOCUMENT STORAGE

This document was created using Microsoft Word 97. The file is stored in AMI's Process Asset Library.

### 9.4 PROCESS OWNER

The AMI Software Engineering Process Group is responsible for maintaining this process.